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UTILITY PATENT APPLICATION TRANSMITTAL
(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	080398.P162
First Inventor or Application Identifier	David Alan Desch
Title	A SYSTEM AND METHOD FOR PROVIDING DIGITAL VIDEO AND AUDIO
Express Mail Label No.	EL123181785US

APPLICATION ELEMENTS
See MPEP chapter 600 concerning utility patent application contents

ADDRESS TO: Assistant Commissioner for Patents
Box Patent Application
Washington, DC 20231

1. ☒ Fee Transmittal Form
(Submit an original, and a duplicate for fee processing)

2. ☒ Specification   *Total Pages* 32
(preferred arrangement set forth below)
- Descriptive title of the Invention
- Cross References to Related Applications
- Statement Regarding Fed sponsored R & D
- Reference to Microfiche Appendix
- Background of the Invention
- Brief Summary of the Invention
- Brief Description of the Drawings *(if filed)*
- Detailed Description
- Claim(s)
- Abstract of the Disclosure

3. ☒ Drawing(s) *(35 CFR 113)*   *Total Sheets* 7

4. Oath or Declaration   *Total Pages* 2
   a. ☒ Newly executed (original copy)
   b. ☐ Copy from a prior application (37 CFR 1.63(d))
   (for continuation/divisional with Box 16 completed)
   [Note Box 5 below]
   i. ☐ DELETION OF INVENTOR(S)
   Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).

NOTE FOR ITEMS 1 & 13: IN ORDER TO BE ENTITLED TO PAY SMALL ENTITY FEES, A SMALL ENTITY STATEMENT IS REQUIRED (37 C.F.R. § 1.27), EXCEPT IF ONE FILED IN A PRIOR APPLICATION IS RELIED UPON (37 C.F.R. § 1.28).

5. ☐ Microfiche Computer Program *(Appendix)*

6. Nucleotide and/or Amino Acid Sequence Submission
(if applicable, all necessary)
   a. ☐ Computer Readable Copy
   b. ☐ Paper Copy (identical to computer copy)
   c. ☐ Statement verifying identity of above copies

ACCOMPANYING APPLICATION PARTS

7. ☒ Assignment Papers (cover sheet & document(s))

8. ☐ 37 CFR 3.73(b) Statement *(when there is an assignee)*   ☐ Power of Attorney

9. ☐ English Translation Document *(if applicable)*

10. ☐ Information Disclosure Statement (IDS)/PTO - 1449   ☐ Copies of IDS Citations

11. ☐ Preliminary Amendment

12. ☒ Return Receipt Postcard (MPEP 503) *(Should be specifically itemized)*

13. ☐ *Small Entity Statement(s)*   ☐ Statement filed in prior application, Status still proper and desired

14. ☐ Certified Copy of Priority Document(s) *(if foreign priority is claimed)*

15. ☐ Other: . . . .

16. If a CONTINUING APPLICATION, *check appropriate box, and supply the requisite information below and in a preliminary amendment:*

☐ Continuation   ☐ Divisional   ☐ Continuation-in-part (CIP)   of prior application No:_____/_____

Prior application Information: Examiner_____   Group/Art Unit: _____

For **CONTINUATION or DIVISIONAL APPS only:** The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 4b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

17. CORRESPONDENCE ADDRESS

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| Name (Print/Type) | Kimberley G. Nobles | | |
| Signature | *[signature]* | Date | 10/30/98 |

FEE TRANSMITTAL

Patent fees are subject to annual revision on October 1.
These are the fees effective October 1, 1997.
Small Entity payments must be supported be a small entity statement,
otherwise large entity fees must be paid. See Forms PTO/SB/09-12.
See 37 C.F.R. §§ 1.28 and 1.28

Complete if Known

Application Number	
Filing Date	10/30/98
First Named Inventor	David Alan Desch
Examiner Name	
Group Art Unit	
Attorney Docket Number	080398.P162

TOTAL AMOUNT OF PAYMENT ($) 1286.00

METHOD OF PAYMENT (check one)

1. ☒ The Commissioner is hereby authorized to charge indicated fees and credit any over payments to:

Deposit Account Number: 02-2666

Deposit Account Name: Blakely, Sokoloff, Taylor & Zafman LLP

☒ Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17

☐ Charge the Issue Fee Set in 37 CFR 1.18 at the Mailing of the Notice of Allowance

2. ☒ Payment Enclosed:

☒ Check ☐ Money Order ☐ Other

FEE CALCULATION (fees effective 10/01/96)

1. FILING FEE

Large Entity Fee Code	Fee ($)	Small Entity Fee Code	Fee ($)	Fee Description	Fee Paid
101	790	201	395	Utility filing fee	$790
106	330	206	165	Design filing fee	
107	540	207	270	Plant filing fee	
108	790	208	395	Reissue filing fee	
114	150	214	75	Provisional filing fee	

SUBTOTAL (1) ($) 790.00

2. EXTRA CLAIM FEES

	Extra Claims		Fee from below	Fee Paid
Total Claims	37	-20** = 17	X $22.00 =	374.00
Independent Claims	4	-3** = 1	X $82.00 =	82.00
Multiple Dependent			=	

**or number of previously paid, if greater; For Reissues, see below*

Large Entity Fee Code	Fee ($)	Small Entity Fee Code	Fee ($)	Fee Description
103	22	203	11	Claims in excess of 20
102	82	202	41	Independent claims in excess of 3
104	270	204	135	Multiple Dependent claim
109	82	209	41	**Reissue independent claims over original patent
110	22	210	11	**Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) ($) 456.00

FEE CALCULATION (continued)

3. ADDITIONAL FEE

Large Entity Fee Code	Fee ($)	Small Entity Fee Code	Fee ($)	Fee Description	Fee Paid
105	130	205	65	Surcharge - late filing fee or oath	
127	50	227	25	Surcharge - late provisional filing fee or cover sheet.	
139	130	139	130	Non-English specification	
147	2,520	147	2,520	For filing a request for reexamination	
112	920*	112	920*	Requesting publication of SIR prior to Examiner action	
113	1,840*	113	1,840*	Requesting publication of SIR after Examiner action	
115	110	215	55	Extension for response within first month	
116	400	216	200	Extension for response within second month	
117	950	217	475	Extension for response within third month	
118	1,510	218	755	Extension for response within fourth month	
☐ 128		228		Extension for response within fifth month	
119	310	219	155	Notice of Appeal	
120	310	220	155	Filing a brief in support of an appeal	
121	270	221	135	Request for oral hearing	
138	1,510	138	1,510	Petition to institute a public use proceeding	
140	110	240	55	Petition to revive - unavoidably	
141	1,320	241	660	Petition to revive - unintentionally	
142	1,320	242	660	Utility issue fee (or reissue)	
143	450	243	225	Design issue fee	
144	670	244	335	Plant issue fee	
122	130	122	130	Petitions to the Commissioner	
123	50	123	50	Petitions related to provisional applications	
126	240	126	240	Submission of Information Disclosure Stmt	
581	40	581	40	Recording each patent assignment per property (times number of properties)	40.00
146	790	246	395	Filing a submission after final rejection (37 CFR 1.129(a))	
149	790	249	395	For each additional invention to be examined (37 CFR 1.129(b))	

Other fee (specify) _____

Other fee (specify) _____

* Reduced by Basic Filing Fee Paid

SUBTOTAL (3) ($) 40.00

SUBMITTED BY

		Complete (if applicable)	
Typed or Printed Name	Kimberley G. Nobles	Reg. Number	38,255
Signature	[signature] Date 10/30/98	Deposit Account User ID	02-2666

APPLICATION FOR UNITED STATES PATENT

FOR

A SYSTEM AND METHOD FOR PROVIDING

DIGITAL VIDEO AND AUDIO BROADCASTS

Inventor:

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Prepared by:

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BACKGROUND OF THE INVENTION

1.   Field of the Invention

The present invention relates to a system and method for providing digital video and audio broadcasts.

5   ## 2.   Description of Art Related to the Invention

Over the last few years, there has been a growing demand for entertainment systems working in conjunction with various types of broadcasting systems. One type of entertainment system includes a broadcast satellite system; namely, a digital satellite system (DSS). The DSS typically

10   comprises an antenna, an integrated receiver decoder (IRD) and a television receiver (TV). In addition, the DSS may include an analog video cassette recorder (VCR) that receives analog data for recording purposes. The operations of the IRD are controlled by a remote control.

The antenna receives digital bit streams from a satellite and routes the

15   digital bit streams to the IRD. Typically, a digital bit stream includes sensory data (e.g., video and/or audio) and programming data for one or more shows. Existing DSS receivers are incompatible with terrestrially-broadcast local stations because the DSS antenna and existing television antennas or television cable systems are entirely different in design.

20   Recent advances by Sony Corporation has resulted in the introduction of an analog NTSC-based television having an input for receiving cable-based broadcasts and a separate input for receiving local, cabled-based and/or

terrestrial-based digital broadcasts. As a result, the consumer may select to view DSS channels and local/terrestrial/cable-based channels through the use of a single DSS system by selecting the appropriate input on the television. However, such a system does not enable the user to surf through the channels from the

5   two different broadcast sources in a seamless manner. The user has to first select the source and then select from among the channels available from that particular source. In addition, such a system does not permit the simultaneously viewing of more than one program from digitally encoded source or sources.

Accordingly, there is a need in the technology for a method and apparatus

10   for facilitating seamless channel surfing or viewing of programs provided from at least two different sources. In addition, there is a need in the technology for simultaneously viewing of programs from more than one source. As a result, the consumer's viewing choices may be maximized.

SUMMARY OF THE INVENTION

One aspect of the present invention relates to a system and method for selecting the sources of at least two shows capable of being received and displayed by an entertainment system. The user selects for viewing, a first show associated

5   with a first channel from a first source. The first show is then displayed. The user also selects for viewing, a second show associated with a second channel from any one of the first and a second sources. The second show is then displayed. A second aspect of the present invention relates to a system and method for selecting the sources of at least two shows capable of being received

10 and displayed by an entertainment system. The user selects for viewing, a first show associated with a first channel from a first source. The first show is displayed on a first portion of a display screen. The user also selects for viewing, a second show associated with a second channel from any one of the first and a second sources. The second show is simultaneously displayed on a second

15 portion of the display screen.

BRIEF DESCRIPTION OF THE DRAWINGS

The features and advantages of the present invention will become apparent from the following detailed description in combination with the figures listed below.

5   Figure 1 is an illustrative embodiment of an entertainment system utilizing the present invention.

Figure 2 is a block diagram of one embodiment of an integrated receiver decoder implemented within the entertainment system of Figure 1.

Figures 3A and 3B illustrate a detailed block diagram of one embodiment

10   of the main decoder, graphics processing and OSD unit implemented within the integrated receiver decoder of Figure 2.

Figure 4 is one embodiment of a screen menu, shown superimposed over an electronic guide screen, provided for selecting the channel sources for display on a single screen in accordance with the principles of the present invention.

15   Figure 5 is one embodiment of a screen menu, shown superimposed over an electronic guide screen, provided for selecting the channel sources for simultaneous display on two screens in accordance with the principles of the present invention.

Figure 6 is one embodiment of a display having two screens, each of which

20   displays a program having a channel source selected in accordance with the principles of the present invention.

080398.P162   -4-   Patent Application
MES/KGN/rd   October 30, 1998
Express Mail No. EL123181785US

DESCRIPTION OF THE PREFERRED EMBODIMENT

In one embodiment, the present invention relates to a system and method for providing seamless viewing of programs provided from at least two different sources. In one embodiment, the sources may include a satellite broadcasting station, a cable programming station and one or more local programming stations. The sources may be either digital (Advanced Television Systems Committee (ATSC) compliant) or and/or (National Television Systems Committee (NTSC) compliant). In one embodiment, each of the stations may modulate the corresponding broadcast signals using any modulation techniques, including: amplitude modulation, frequency modulation or frequency shift keying, and phase modulation. The present invention also provides simultaneously display and/or recording of programs from two different sources.

Herein, various terms are used to describe certain elements or characteristics of the present invention. For example, a "communication line" is broadly defined as any communication path between a source and a destination. The communication line may include one or more information-carrying lines (electrical wire, fiber optics, cable, etc.) or wireless communications through established techniques such as infrared (IR) and radio frequency (RF) signaling. A "signal" is construed as information transmitted in a parallel or serial manner. Stored within the system, "timer data" includes programming data of shows scheduled to be recorded and programming data of shows chosen by the user to be entered into timer memory but are not scheduled to be recorded. Timer data may further include programming data of shows that have been purchased for viewing. While certain illustrative embodiments are described in order to

convey the spirit and scope of the present invention, such embodiments should not be construed as a limitation on the scope of the present invention.

Referring to Figure 1, one embodiment of an entertainment system utilizing the present invention is shown. The entertainment system 100

5 comprises an antenna 105, a broadcast receiver 110 such as an integrated receiver decoder (IRD) for example, and at least one analog-input peripheral device (e.g., a display monitor such as television receiver "TV" 120 and/or an analog recording device 130 such as a video cassette recorder "VCR"). In an alternate embodiment, the components (i.e., antenna 105, broadcast receiver 110, TV 120

10 and VCR 130) may be combined within a single TV receiver. The broadcast receiver 110 also comprises an input port 145 that receives broadcast signals from a programming station 140, such as a cable television station. The broadcast receiver 110 further comprises one or more input ports 155_1-155_n each of which receives broadcast signals from a corresponding local programming (terrestrial)

15 station 150_1 - 150_n.

The broadcast receiver 110, in general, receives a broadcast signal (a digital bit stream for example, from the antenna 105, digital data from the cable programming station 140, and digital and/or analog signal information from each of the programming stations 150_1 - 150_n), and performs operations on the

20 broadcast signal to produce digital and/or analog information. In one embodiment, the satellite broadcasting station (not shown), the cable programming station 140 and the local programming stations 150_1-150_n may modulate the corresponding broadcast signals using any modulation technique, including, but not limited to: amplitude modulation, for example, Quadrature

25 Amplitude Modulation (QAM); frequency modulation or frequency shift keying,

for example, Quaternary Phase Shift Keying (QPSK) and Vestigial Sideband (VSB) shift keying; and phase modulation, for example, Phase Shift Keying (PSK) and Differential Phase Shift Keying (DPSK). By way of example, the satellite broadcasting station may modulate the broadcast signals using QPSK prior to

5   transmission of the corresponding signals; the cable programming station 140 may modulate the broadcast signals using QAM prior to transmission of the corresponding signals; while the local programming stations may modulate the broadcast signals using VSB prior to transmission of the corresponding signals. Although the IRD 110 is implemented as the broadcast receiver in this

10   embodiment, other types of broadcast receivers may be used such as a cable box for a Cable Broadcasting System, an Internet terminal, a digital satellite system (DSS) computer, a combined digital television receiver and the like.

Antenna 105 receives the digital bit stream from an orbiting satellite or a satellite broadcasting station (not shown) and routes the bit stream to IRD 110.

15   The bit stream is formatted in accordance with any video compression function and is usually encrypted under either a symmetric key cryptographic function or a public-key cryptographic function. Typically, the bit stream includes sensory data (e.g., video and/or audio, or communication data) and control information for a number of shows. The control information for each show includes

20   programming data having the following content: date of broadcast, broadcast channel number, show start-time, show end-time, and also show title.

IRD 110 is responsible for: decoding the digital bit stream from antenna 105, decoding the digital and/or analog signals from the cable programming station 140 and/or decoding the digital and/or analog signals from the local

25   programming stations 150_1 - 150_n; for storing channel source data in memory

accessible by channel source software executed by IRD 110; and for processing the decoded bit stream or analog data to produce one or more output signals having appropriate formats. As shown, an output signal is placed in an analog format and sent via communication line 125 to TV 120 for viewing, and/or via

5   communication line 135 to the recording device 130 (such as a VCR) for recording. The analog format may be in accordance with a video format established by National Television Systems Committee (NTSC), or other video formats, including but not limited or restricted to: Phase Alternating Line (PAL), Sequential Couleur Avec Memoire (SECAM) and other recognized formats.

10   Additionally, IRD 110 is responsible for responding to a plurality of commands from a remote control 115. Remote control 115 may include any type of remote control, including one described in U.S. Patent No. 5,453,758 assigned to Sony Corporation of Tokyo, Japan. Examples of commands from remote control 115 include a first command causing IRD 110 to produce an output signal

15   displaying at least an electronic guide screen on TV 120. Likewise, a second command causes IRD 110 to produce another output signal displaying a channel selection menu 400 (see Figure 3 and 4) that is superimposed on the electronic guide screen. The channel selection menu 400 facilitates selection of the channel source for a predetermined number of channels. The channel selection menu.

20   includes a number of option grids as shown in Figures 3 and/or 4. Upon scrolling the channel selection menu to a selected option grid and initiating a third command from the remote control 115, the user may enter the desired channel source into memory as discussed below.

Referring now to Figure 2, one embodiment of an integrated receiver

25   decoder (IRD) 110 is shown. The antenna 105 transfers the bit stream to a front-

end unit 160 of the IRD 110. Although not shown, the front-end unit 160 includes (i) amplification circuitry used to amplify any relatively weak signals received at antenna 105, and (ii) a tuner which allows a user to receive a desired broadcast channel. The cable programming station 140 transmits digital and/or analog signal via the input port 145 to another front-end unit 170, which similarly includes (i) amplification circuitry used to amplify any relatively weak signals received at input port 145, and (ii) a tuner which allows a user to receive a desired broadcast channel. Similarly, each local programming station 150_1-150_n transmits digital and/or analog signals via a corresponding input port 155_1, ..., 155_n to a corresponding front-end unit 180_1-180_n, which similarly includes (i) amplification circuitry used to amplify any relatively weak signals received the corresponding input port 155_1, ..., 155_n, and (ii) a corresponding tuner which allows a user to receive a desired broadcast channel.

In the case where the user wishes to view a show provided by the digital satellite system service provider, the bit stream associated with the desired broadcast channel is routed from front-end unit 160 to a demodulator 165. In demodulator 165, the bit stream is initially processed before transferring to a main decoder, graphics processing and OSD block 210 for further processing. Such initial processing may include exposing the bit stream to QPSK-demodulation, viterbi-decoding, de-interleaving and Reed-Solomon decoding, and any other frequency demodution.

In the case where the user wishes to view a show provided by the cable programming station 140, the digital and/or analog signal associated with the desired broadcast cable channel is routed from the front-end unit 170 to a demodulator 175. In demodulator 175, the analog data is initially processed

before transferring to the main decoder, graphics processing and OSD block 210 for further processing as discussed above. Such initial processing may include exposing the bit stream to QAM demodulation and any other amplitude demodulation.

5   In the case where the user wishes to view a show provided by any of the local programming stations 150_1-150_n, the digital and/or analog signals associated with the desired broadcast local channel are routed from the front-end unit 150_1,..., 150_n to the corresponding demodulator 185_1-185_n. In demodulators 185_1-185_n, the digital and/or analog signals are initially processed before

10   transferring to the main decoder, graphics processing and OSD block 210 for further processing as discussed above. Such initial processing may include exposing the bit stream to VSB demodulation and any other phase demodulation.

       In certain situations, IRD 110 is connected to other peripheral devices

15   though an interface (IF) 215. In this embodiment, IF 215 may include a link layer integrated circuit (IC) and a physical layer IC (not shown) and complies with the IEEE standards document 1394 entitled "Standard for High Performance Serial Bus" (hereinafter referred to as "IEEE 1394"). This enables IRD 110 to connect to digital-input peripheral devices such as digital VCRs, digital video disk players,

20   digital laser disk players and the like. These digital-input peripheral devices communicate with a central processing unit (CPU) within main decoder, graphics processing and OSD block 210 through IF 215 and either extension bus 220 or alternatively an IEEE 1394 serial bus 225.

       Referring still to Figure 2, extension bus 220 supports input/output (I/O)

25   communications by providing a communication path between electronic

circuitry of the main decoder, graphics processing and OSD block 210 and a number I/O related devices. These I/O related devices include a transceiver device 230 (e.g., a modem), a remote command unit interface (RCU-IF) 235, a transmitter controller 240 and an external non-volatile memory element 245

5   (e.g., read only memory "ROM", flash memory, etc.). RCU-IF 235 receives commands from the remote control (e.g. 115 of Figure 1), and decodes the commands to produce interrupt request signals (IRQs) corresponding to these commands. Each IRQ is transferred to the CPU within the main decoder, graphics processing and OSD block 210.

10   Transmitter controller 240 provides a communication mechanism so that IRD 110 is able to communicate with an analog VCR via a remote transmitter 115 when one of the shows is scheduled to experience a timer event such as a timed recording. Otherwise, communications between the transmitter controller 240 and the remote transmitter 115 are disabled. Examples of the remote transmitter

15   115 may include, but are not limited or restricted to infrared transmitters such as those manufactured and commercially available from Matsushita of Osaka, Japan (referred to as a "VCR mouse"). External non-volatile (NV) memory element 245 is connected to extension bus 220 and contains programming data of shows scheduled to be recorded or to be viewed upon purchase, and software that

20   controls the behavior of the user interface displays based on commands from the remote control as described above and in reference to Figures 3 and 4.

Referring now to Figures 3A and 3B, one embodiment of the electronic circuitry within the main decoder, graphics processing and OSD block 210 is shown. A cross switching multiplex unit 300 such as a multiplexed switch,

25   receives the decoded bit stream from demodulator 165, the digital and/or analog

signals from demodulator 175, and/or the digital and/or analog signals from demodulators $185_1,...,185_n$. Depending on commands from the CPU 325, representative of whether viewing of channels broadcast by the satellite system and/or the cable television system and/or one or more of the local programming stations 150_1-150_n, is desired, the switching unit 300 transmits one or more of: the decoded bit stream from demodulator 165 and/or the digital and/or analog signals from demodulator 175 and/or the decoded digital and/or analog signals from demodulator $185_1,...,185_n$ to the respective Transport Packet Parser (TPP) and filter blocks 302, 306, 310_1-310_n. If a decoded bit stream is transmitted, the TPP in the respective TPP and filter blocks 302, 306, 310_1-310_n receives the decoded bit stream and parses the bit stream.

If analog data is transmitted, the filter in the respective TPP and filter block 302, 306, 310_1-310_n filters the analog data. The parsed bit stream or the filtered analog data is decrypted by a respective cryptographic engine 304, 308, 312_1-312_n, which may operate in accordance with a cryptographic function, for example Data Encryption Standard (DES).

CPU 325 controls the operations of the IRD 110 by communicating with a plurality of elements through an internal high-speed bus 330. These elements include an optional volatile memory 335, at least one non-volatile (NV) memory element 340 (e.g., read only memory "ROM", erasable programmable read only memory "EPROM", flash memory, etc.) that contains software programs, extension bus interface 345, and traffic controller 320. NV memory element 340, in lieu of external NV memory 245 of Figure 2, may be used to store software needed by CPU 325 (e.g., interrupt software) or perhaps timer data.

Extension bus interface 345 allows CPU 325 to communicate with the devices coupled to extension bus 220.

Based on commands from the CPU 325, the traffic controller (Tc) 320 provides any one of: (i) the parsed bit stream from demodulator 165 to the

5   transport demultiplexor 350; (ii) the digital and/or analog signals from demodulator 175 to transport demultiplexor 370; (iii) the digital and/or analog signals from demodulator 185_1,...,185_n, to a corresponding transport demultiplexor 370_1,..., 370_n. In one embodiment, the traffic controller 320 may provide, simultaneously, and in any combination, any of the (i) the parsed bit

10   stream from demodulator 165 to the transport demultiplexor 350; (ii) the digital and/or analog signals from demodulator 175 to transport demultiplexor 360; (iii) the digital and/or analog signals from demodulator 185_1,...,185_n, to a corresponding transport demultiplexor 370_1,..., 370_n. That is, the traffic controller 320 may provide broadcast signals from any combination (i.e., two or

15   more) of broadcast sources, e.g., from the antenna 105 (Figure 1), the cable programming station 140 (Figure 1), and any one or more of the local programming stations 150_1,...,150_n (Figure 1). The broadcast signals from the different sources may thereafter be displayed simultaneously on separate screens of a single display (see, for example, Figure 5). In one embodiment, the broadcast

20   signals from the different sources may be displayed simultaneously while being programmed to be recorded by the VCR 130 (Figure 1). Alternatively, the broadcast signal from a first source may be displayed on a first screen of the display, while another broadcast signal from a second source may be configured for recording. In this alternative embodiment, the broadcast signals from both

25   sources may be displayed on separate screens on a single display while the broadcast signal from the second source is being recorded. The present

invention may be extended to simultaneously providing broadcast signals from more than two different sources, either for simultaneously display, for simultaneous recording or for simultaneously recording and displaying.

The parsed bit stream provided to the transport demultiplexor 350 is demultiplexed and provided to a video decoder 352, an audio decoder 354 and a video format converter, graphics processing and on screen display (OSD) circuit 380. Similarly, the digital and/or analog signals provided to the transport demultiplexor 360 are demultiplexed and the video signals are provided to a video decoder 362, the audio signals are provided to an audio decoder 364 and synchronization signals are provided to the video format converter, graphics processing and OSD circuit 380. The signals provided to any one of the transport demultiplexors 370_1-370_n are demultiplexed and provided to a corresponding high speed auxiliary output terminal and to the video format converter, graphics processing and OSD circuit 380. The outputs of the audio decoders 354 and 364 are provided to corresponding audio circuits in the audio section 394, which process the audio signals. The processed audio signals are subsequently provided as audio outputs.

The processed video signals from video decoders 352 and 362 are decoded and subsequently provided to the video format converter, graphics processing and OSD circuit 380. The output of the video format converter, graphics processing and OSD circuit 380 are subsequently provided to a splitter 382, which forwards the signals to one of a signal encoder 390 and/or signal encoder 392, in response to commands from the CPU 325. The output of the signal encoder 390 are also analog video signals provided for viewing on TV 120 (Figure 1) while

the output of the signal encoder 392 are analog video signals provided to VCR 130.

Referring to Figures 3A & 3B, the operations performed by IRD 110 to support selective display and/or recording of programming data associated with
5 programs from one or more sources are described. Upon receiving the first command from the remote control (e.g., user depressing "guide" button of remote control), RCU-IF 235 transfers a first interrupt request signal (IRQ1), corresponding to the first command, directly to CPU 325 or indirectly through a queuing mechanism (not shown). In response to detecting IRQ1, CPU 325
10 executes interrupt software contained in external NV memory element 245 (or NV memory element 340) and services IRQ1.

More specifically, in order to service IRQ1, CPU 325 executes interrupt software, normally coded to control the video format converter, graphics processing and OSD logic block 380, to produce an electronic guide screen, such as
15 that shown in Figure 4. The first operation involves CPU 325 signaling traffic controller 320, via communication line 355, to retrieve at least programming data contained in external volatile memory 315 and route the programming data to graphics processing and OSD logic block 380. Next, CPU 325 controls the video format converter, graphics processing and OSD logic block 350 to decompress the
20 programming data in accordance with a recognized video format and to produce (for display) the electronic guide screen in a manner well-known in the art. In general, the programming data is processed as a bitmap to overlay appropriate grids forming the layout of the electronic guide screen.

The electronic guide screen may be superimposed over video by mixing
25 signals representing the electronic guide screen with video output from video

decoder 352 or 362. The video output includes video signals received by main decoder, graphics processing and OSD block 210 and decompressed in accordance with Moving Picture Experts Group (MPEG), Joint Picture Experts Group (JPEG) or any other video decompression function. Alternatively, the electronic guide

5   screen may be superimposed over a still background. In any event, the resulting mixed video output is transferred to signal encoder 390 and/or signal encoder 392. Signal encoders 390 and 392 each convert the mixed video output into an analog signal having a recognized video format such as NTSC, PAL, SECAM and the like (or may go directly to a CRT or other display device in a system which is

10   embodied in a TV receiver).

As the user selects a grid of the electronic guide screen associated with a channel that is provided from a satellite station (e.g., received via antenna 105), the CPU 325 causes the front-end unit 160 to tune to receive and display video of that show as background. Upon RCU-IF 235 receiving a command from the

15   remote control (e.g., user depressing "select" button of the remote control) while the grid of the current-broadcast show is selected, RCU-IF 235 transfers a second interrupt request signal (IRQ2). In response to detecting IRQ2, CPU 325 executes interrupt software and services IRQ2 by signaling the front-end unit 160 to tune to the broadcast channel of the current-broadcast show and to discontinue

20   producing the electronic guide screen.

As the user selects a grid of the electronic guide screen associated with a channel that is provided from the cable programming station 140, the CPU 325 causes the front-end unit 170 to tune to receive and display video of that show as background. Upon RCU-IF 235 receiving a third command from the remote

25   control (e.g., user depressing "select" button of the remote control) while the grid

of the current-broadcast show is selected, RCU-IF 235 transfers a third interrupt request signals (IRQ3). In response to detecting IRQ2, CPU 325 executes interrupt software and services IRQ3 by signaling the front-end unit 140 to tune to the broadcast channel of the current-broadcast show and to discontinue producing

5   the electronic guide screen.

As the user selects a grid of the electronic guide screen associated with a channel that is provided from the local programming stations 150_1 - 150_n, the CPU 325 causes the corresponding front-end unit 180_1 - 180_n to tune to receive and display video of that show as background. Upon RCU-IF 235 receiving a

10   fourth command from the remote control (e.g., user depressing "select" button of the remote control) while the grid of the current-broadcast show is selected, RCU-IF 235 transfers a fourth interrupt request signal (IRQ4). In response to detecting IRQ4, CPU 325 executes interrupt software and services IRQ4 by signaling the corresponding front-end unit 180_1 - 180_n to tune to the broadcast

15   channel of the current-broadcast show and to discontinue producing the electronic guide screen. Likewise, additional commands may be generated to signal other front end units, 180_1-180_n, to tune to the broadcast channel of choice.

Since the signals received from the different sources, i.e., from each of the

20   satellite station (via antenna 105), the cable programming station 140 and/or the local programming station 150_1-150_n, are separately processed, the user may surf through channels provided from any of the different sources in a seamless manner.

As the user selects a grid of the electronic guide screen associated with a

25   channel that may be provided from more than one source, for example, from a

satellite station, a cable station or any of a number of local programming stations, CPU 325 executes the channel source software which displays a channel source selection menu 400 that is superimposed over the electronic guide screen as shown in Figure 4.

5   Referring now to Figure 4, the channel selection menu 400 includes a header 405 and a plurality of option grids 410_{1-n}. For example, as shown, the header grid 405 indicates that the user has selected a channel that may be provided from more than one source, e.g., from each of the satellite station (via antenna 105), the cable programming station 140 and/or the local programming

10   station 150_1-150_n. Each of the option grids 410_{1-n} is divided into two columns 420a and 420b. Column 420a displays the channel numbers and column 420b displays the sources (LOCAL, CABLE or DSS) corresponding to the channel number in column 420a, that may be selected. One of the two sources is highlighted to facilitate user selection. If the highlighted source, e.g., LOCAL, is

15   desired for a particular channel (e.g., channel 4), the user may depress the "select" button on the remote control. If another source is desired, the user may use an arrow button (in this case the right arrow button) to move to the next source (in this case, "CABLE"), which lights up in response. The highlighted CABLE source may be likewise selected. In one embodiment, the user may select the channel

20   sources for any number or all the affected channels (e.g., channels 100 - 125) using the menu 400 provided as shown in Figure 4.

The user may select viewing and/or recording of a program from any of the programming sources. Referring to Figures 2-4, upon RCU-IF 235 receiving a fifth command from the remote control while the first option grid 410_1 is

25   selected, RCU-IF 235 transfers a fifth interrupt request signal (IRQ5). In response

to detecting IRQ5, CPU 525 executes interrupt software contained in external NV memory element 245 and services IRQ5. Servicing IRQ5 involves loading channel source selection programming data into memory (e.g., external NV memory element 245) for recording of a program by VCR 130. A first state value

5   will be subsequently loaded into the record parameter of channel source software, which when executed, will direct the switching unit 300 to switch to receive digital data from demodulator 165, or to receive analog data from demodulator 175 or to receive data from demodulators 185_1-185_n. In addition, servicing IRQ5 causes the CPU 325 to direct either the front end unit 160 to tune .

10   to the corresponding station provided by a satellite via antenna 105, or the front end unit 170 to tune to the corresponding station provided by the cable programming station 140, or the front end unit(s) 180_1-180_n to tune to the corresponding local programming station(s) 150_1-150_n..

     The user may also select viewing and/or recording of two or more

15   programs from different sources, simultaneously. In one embodiment, a multiple channel selection menu 500 superimposed over a guide screen, as shown in Figure 5 is displayed when the viewer desires viewing and/or recording of two or more programs from different sources, simultaneously. The multiple channel selection menu 500 includes a header 505, and two columns

20   510a and 510b. Column 510a illustrates the channels that may be selected for display on a first screen 610 (Figure 6) (and/or also for simultaneous recording) and column 510b illustrates the channels that may be selected for display on a second screen 620 (and/or also for simultaneous recording). In one embodiment, each channel for display on the first screen 610 is highlighted, and selection of

25   the channel may be entered by depressing the "Enter" key on the remote transmitter 115. The user may peruse through the programs in any of the

channels by using the "Up" or "Down" arrow keys on the transmitter 115. Selection or viewing of the programs for each channel on the second screen 620 may likewise be provided. Figure 6 is one embodiment of a display 600 such as TV 120 that displays programs from a first source on a first screen 610, and

5   displays programs from a second source on a second screen 620 in a manner as discussed above. As a result, the user may view both programs while recording either or both programs.

The present invention thus provides a method and apparatus for facilitating seamless channel surfing or viewing of programs provided from at

10   least two different sources. The present invention also provides simultaneously viewing and/or recording of programs from two or more different sources. As a result, the consumer's viewing choices are maximized.

The present invention described herein may be designed in many different embodiments and using many different configurations. As discussed

15   herein, the architecture of the IRD is flexible. While the present invention has been described in terms of various embodiments, other embodiments may come to mind to those skilled in the art without departing from the spirit and scope of the present invention. The invention should, therefore, be measured in terms of the claims which follow.

CLAIMS

What is claimed is:

1   1.   A method for selecting the sources of at least two shows capable of

2   being received and displayed by an entertainment system, comprising:

3   selecting for viewing, a first show associated with a first channel from a

4   first source;

5   displaying the first show;

6   selecting for viewing, a second show associated with a second channel

7   from any one of the first and a second sources; and

8   displaying the second show.

1   2.   The method of Claim 1, wherein said first source is selected from a

2   group consisting of: a satellite-based station, a cable-based station and a local

3   station.

1   3.   The method of Claim 2, wherein said second source is selected from

2   a group consisting of: a satellite-based station, a cable-based station and a local

3   station, said second source being different from said first source.

1   4.   The method of Claim 1, further comprising:

2   loading programming data associated with the selected first channel of the

3   first show into a memory of the entertainment system; and

4   loading programming data associated with the selected second channel of

5   the second show into the memory of the entertainment system.

1   5.   The method of Claim 4, further comprising:

2   prompting selection of the first and the second shows corresponding to the

3   first and the second channels, by executing software by a central processing unit,

4   implemented within the entertainment system, to produce a screen menu; and

5   wherein the step of selecting comprises selecting a first option grid of the screen

6   menu to load the corresponding programming data into the memory and

7   selecting a second option grid of the screen menu to load the corresponding

8   programming data into the memory.

1   6.   A method for selecting the sources of at least two shows capable of

2   being received and displayed by an entertainment system, comprising:

3   selecting for viewing, a first show associated with a first channel from a

4   first source;

5   displaying the first show on a first portion of a display screen;

6   selecting for viewing, a second show associated with a second channel

7   from any one of the first and a second sources; and

8   simultaneously displaying the second show on a second portion of the

9   display screen.

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1   7.   The method of Claim 6, wherein the first source transmits broadcast

2   signals associated with the first show using a first coding technique.

1   8.   The method of Claim 7, wherein the second source transmits

2   broadcast signals associated with the second show using a second coding

3   technique that is different from the first coding technique.

1   9.   The method of Claim 8, wherein the first and second coding

2   techniques are selected from a group consisting of: amplitude modulation,

3   frequency modulation and phase modulation.

1   10.   The method of Claim 6, wherein said first source is selected from a

2   group consisting of: a satellite-based station, a cable-based station and a local

3   station.

1   11.   The method of Claim 7, wherein said second source is selected from

2   a group consisting of: a satellite-based station, a cable-based station and a local

3   station, said second source being different from said first source.

1   12.   The method of Claim 6, further comprising:

2   loading programming data associated with the selected first channel of the

3   first show into a memory of the entertainment system; and

4   loading programming data associated with the selected second channel of

5   the second show into the memory of the entertainment system.

1   13.   The method of Claim 12, further comprising:

2   prompting selection of the first and the second shows corresponding to the

3   first and the second channels, by executing software by a central processing unit,

4   implemented within the entertainment system, to produce a screen menu; and

5   wherein the step of selecting comprises selecting a first option grid of the screen

6   menu to load the corresponding programming data into the memory and

7   selecting a second option grid of the screen menu to load the corresponding

8   programming data into the memory.

1   14.   The method of Claim 7, further comprising recording of one of said

2   first and said second shows.

1   15.   The method of Claim 14, further comprising recording of the other

2   one of said first and said second shows.

1   16.   An entertainment system comprising:

2   a display monitor; and

3   a broadcast receiver coupled to the display monitor, the broadcast receiver

4   including

5   a first front-end unit capable of receiving programming data

6   associated with a first show broadcast from a first source via a first channel

7   for viewing on the display monitor,

8   a second front-end unit capable of receiving programming data

9   associated with a second show broadcast from a second source via a second

10   channel for viewing on the display monitor,

11   a plurality of memory elements, and

12   a central processing unit coupled to the plurality of memory

13   elements, the central processing unit executing software to assist the

14   broadcast receiver in loading programming data associated with a selected

15   one of the first and the second shows into one of the plurality of memory

16   elements along with information, to display said first show on the display

17   monitor upon receiving a first selection signal, and to display said second

18   show on the display monitor upon receiving a second selection signal, the

19   first and second shows being displayed continuously.

1   17.   The entertainment system of claim 16, wherein the display monitor

2   includes a television receiver.

1   18.   The entertainment system of claim 16, wherein the broadcast

2   receiver includes an integrated receiver decoder.

1   19.   The entertainment system of claim 16, wherein the central

2   processing unit of the broadcast receiver executes software to provide a screen

3   menu, selection of a first option grid of the screen menu signals the central

4   processing unit to load a first programming data into the one of the plurality of

5   memory elements indicating that the first show is to be displayed.

1   20.   The entertainment system of claim 19, wherein upon selection of a

2   second option grid, the central processing unit controls loading of a second

3   programming data into the one of the plurality of memory elements indicating

4   that the second show is to be displayed.

1   21.   The entertainment system of Claim 16, wherein the first source

2   transmits broadcast signals associated with the first show using a first coding

3   technique.

1   22.   The entertainment system of Claim 21, wherein the second source

2   transmits broadcast signals associated with the second show using a second

3   coding technique that is different from the first coding technique.

1   23.   The entertainment system of Claim 22, wherein the first and second

2   coding techniques are selected from a group consisting of: amplitude

3   modulation, frequency modulation and phase modulation.

1   24.   The entertainment system of Claim 16, wherein said first source is

2   selected from a group consisting of: a satellite-based station, a cable-based station

3   and a local station.

1   25.   The entertainment system of Claim 24, wherein said second source

2   is selected from a group consisting of: a satellite-based station, a cable-based

3   station and a local station, said second source being different from said first

4   source.

1   26.   An entertainment system comprising:

2   a display monitor; and

3   a broadcast receiver coupled to the display monitor, the broadcast receiver

4 including

5   a first front-end unit capable of receiving programming data

6 associated with a first show broadcast from a first source for viewing on

7 the display monitor,

8   a second front-end unit capable of receiving programming data

9 associated with a second show broadcast from a second source for viewing

10 on the display monitor,

11   a plurality of memory elements, and

12   a central processing unit coupled to the plurality of memory

13 elements, the central processing unit executing software to assist the

14 broadcast receiver in loading programming data associated with a selected

15 one of the first and the second shows into one of the plurality of memory

16 elements along with information, and to simultaneously display said

17 selected first and second shows on the display monitor.

1   27.   The entertainment system of claim 26, wherein the display monitor

2 includes a television receiver.

1   28.   The entertainment system of claim 26, wherein the broadcast

2 receiver includes an integrated receiver decoder.

1   29.   The entertainment system of claim 26, wherein the central

2   processing unit of the broadcast receiver executes software to provide a screen

3   menu, selection of a first option grid of the screen menu signals the central

4   processing unit to load a first programming data into the one of the plurality of

5   memory elements indicating that the first show is to be displayed.

1   30.   The entertainment system of claim 29, wherein upon selection of a

2   second option grid, the central processing unit controls loading of a second

3   programming data into the one of the plurality of memory elements indicating

4   that the second show is to be displayed.

1   31.   The entertainment system of Claim 26, wherein the first source

2   transmits broadcast signals associated with the first show using a first coding

3   technique.

1   32.   The entertainment system of Claim 31, wherein the second source

2   transmits broadcast signals associated with the second show using a second

3   coding technique that is different from the first coding technique.

1   33.   The entertainment system of Claim 32, wherein the first and second

2 coding techniques are selected from a group consisting of: amplitude

3 modulation, frequency modulation and phase modulation.

1   34.   The entertainment system of Claim 26, wherein said first source is

2 selected from a group consisting of: a satellite-based station, a cable-based station

3 and a local station.

1   35.   The entertainment system of Claim 34, wherein said second source

2 is selected from a group consisting of: a satellite-based station, a cable-based

3 station and a local station, said second source being different from said first

4 source.

1   36.   The entertainment system of Claim 26, wherein the central

2 processing unit further executes software to record one of said first and said

3 second shows.

1   37.   The entertainment system of Claim 36, wherein the central

2 processing unit further executes software to record the other one of said first and

3 said second shows.

ABSTRACT OF THE DISCLOSURE

One aspect of the present invention relates to a system and method for selecting the sources of at least two shows capable of being received and displayed by an entertainment system. The user selects for viewing, a first show associated with a first channel from a first source. The first show is then displayed. The user also selects for viewing, a second show associated with a second channel from any one of the first and a second sources. The second show is then displayed. A second aspect of the present invention relates to a system and method for selecting the sources of at least two shows capable of being received and displayed by an entertainment system. The user selects for viewing, a first show associated with a first channel from a first source. The first show is displayed on a first portion of a display screen. The user also selects for viewing, a second show associated with a second channel from any one of the first and a second sources. The second show is simultaneously displayed on a second portion of the display screen.
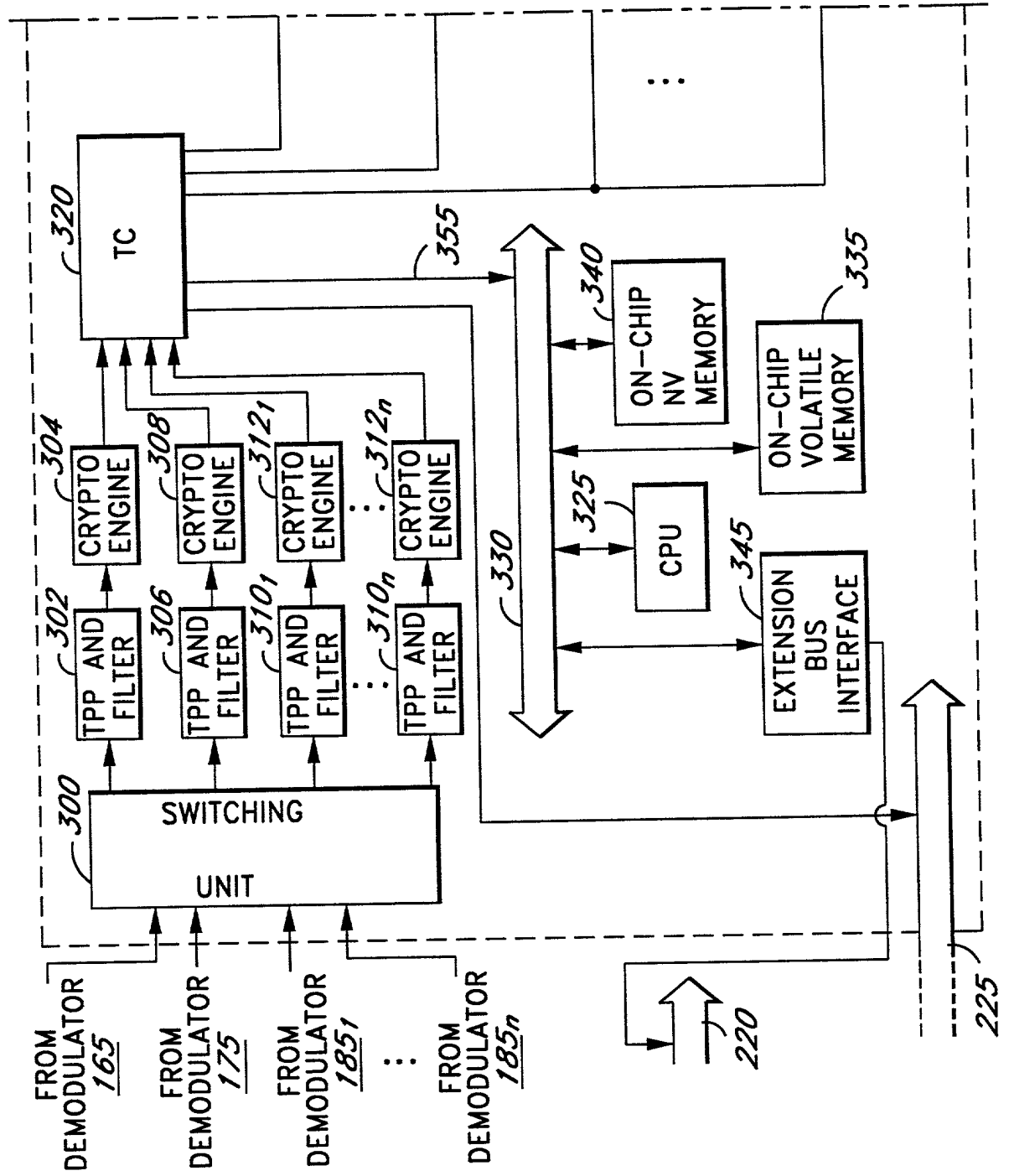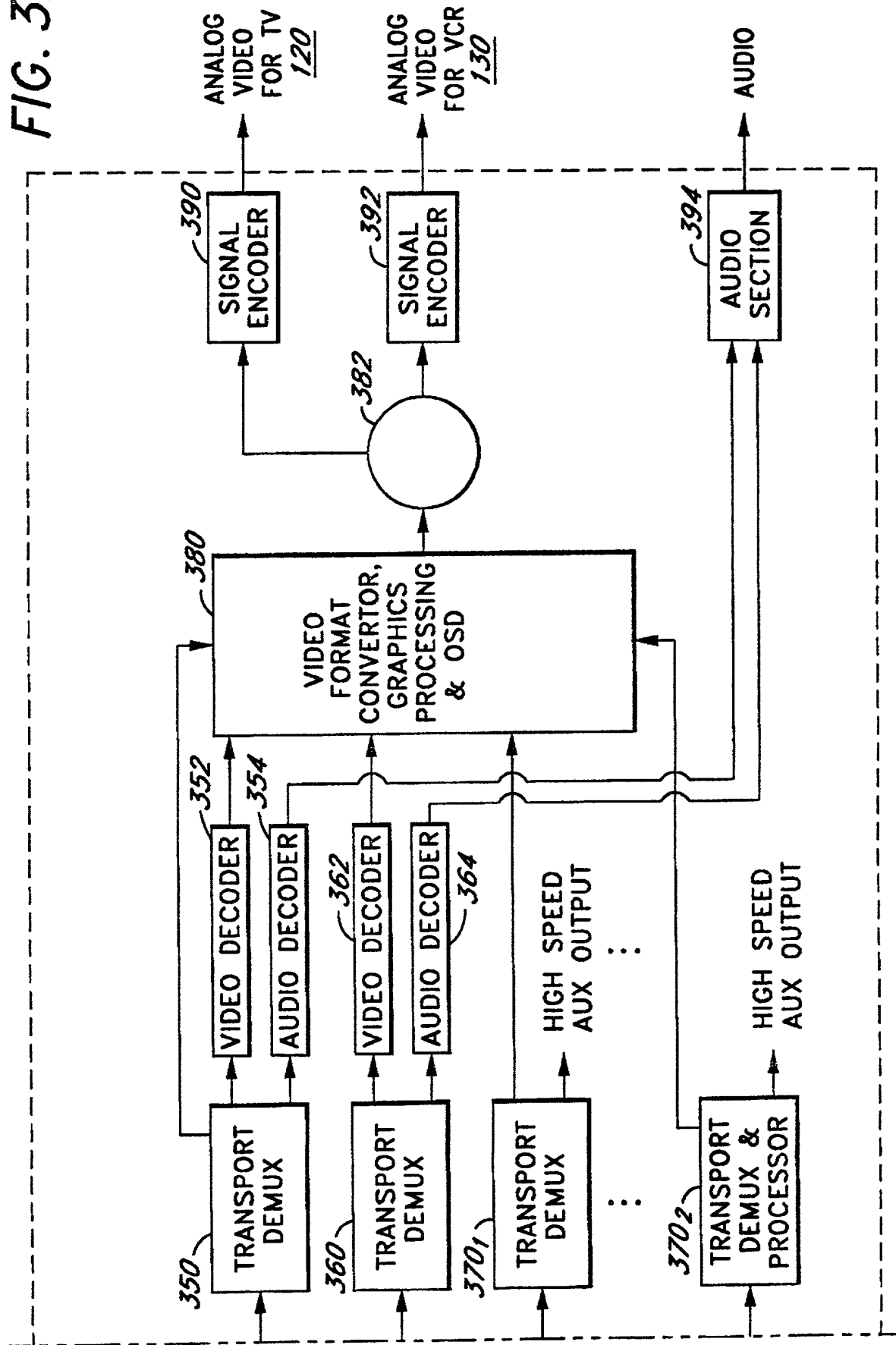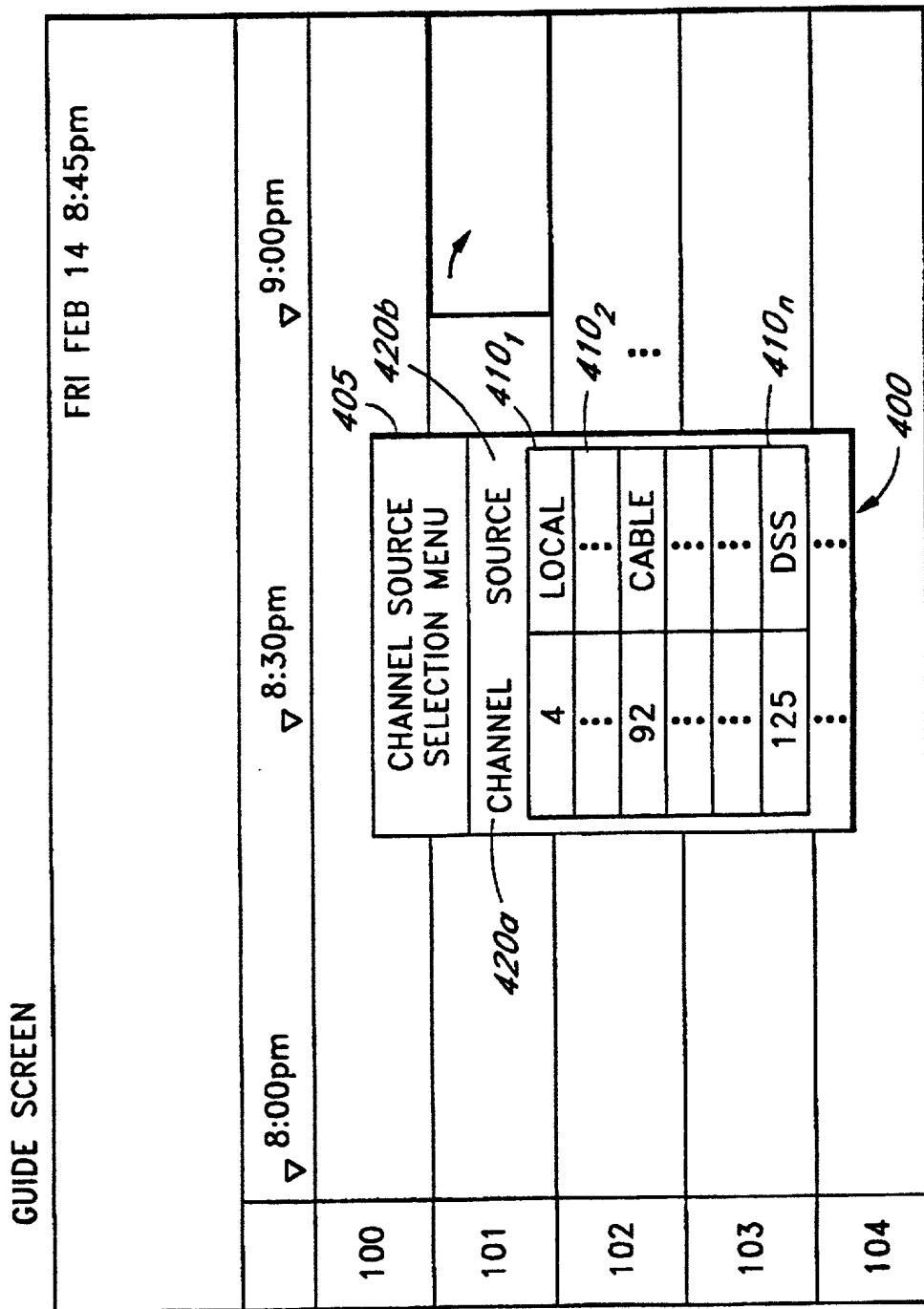
FIG. I

FIG. 2
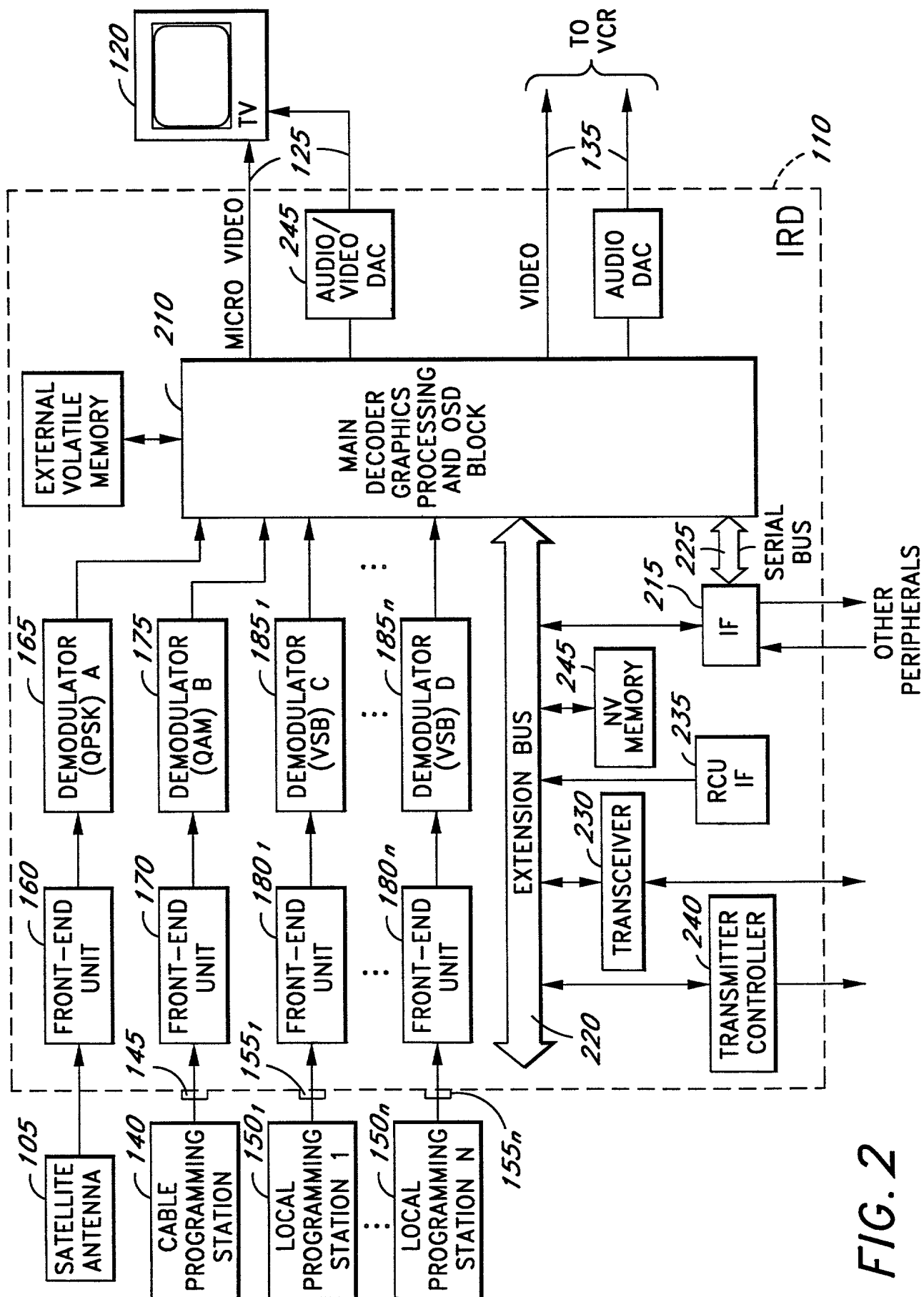
FIG. 3

FIG. 3A	FIG. 3B

FIG. 3A

FIG. 3B

GUIDE SCREEN

FRI FEB 14 8:45pm

▽ 8:00pm   ▽ 8:30pm   ▽ 9:00pm

100			
101			
102			
103			
104			

405
420b
410₁
410₂
...
410ₙ
400
420a

CHANNEL SOURCE SELECTION MENU

CHANNEL	SOURCE
4	LOCAL
...	...
92	CABLE
...	...
...	...
125	DSS
...	...

FIG. 4

GUIDE SCREEN

FRI FEB 14 8:45pm

▽ 8:00pm   ▽ 8:30pm   ▽ 9:00pm

100

101

102

103

104

510a

510b

505

500

MULTIPLE CHANNEL SELECTION MENU

SCREEN #1		SCREEN #2	
CHANNEL	SOURCE	CHANNEL	SOURCE
4	LOCAL	4	LOCAL
...	...	...	...
99	CABLE	99	CABLE
...	...	...	...
125	DSS	125	DSS

FIG. 5

600

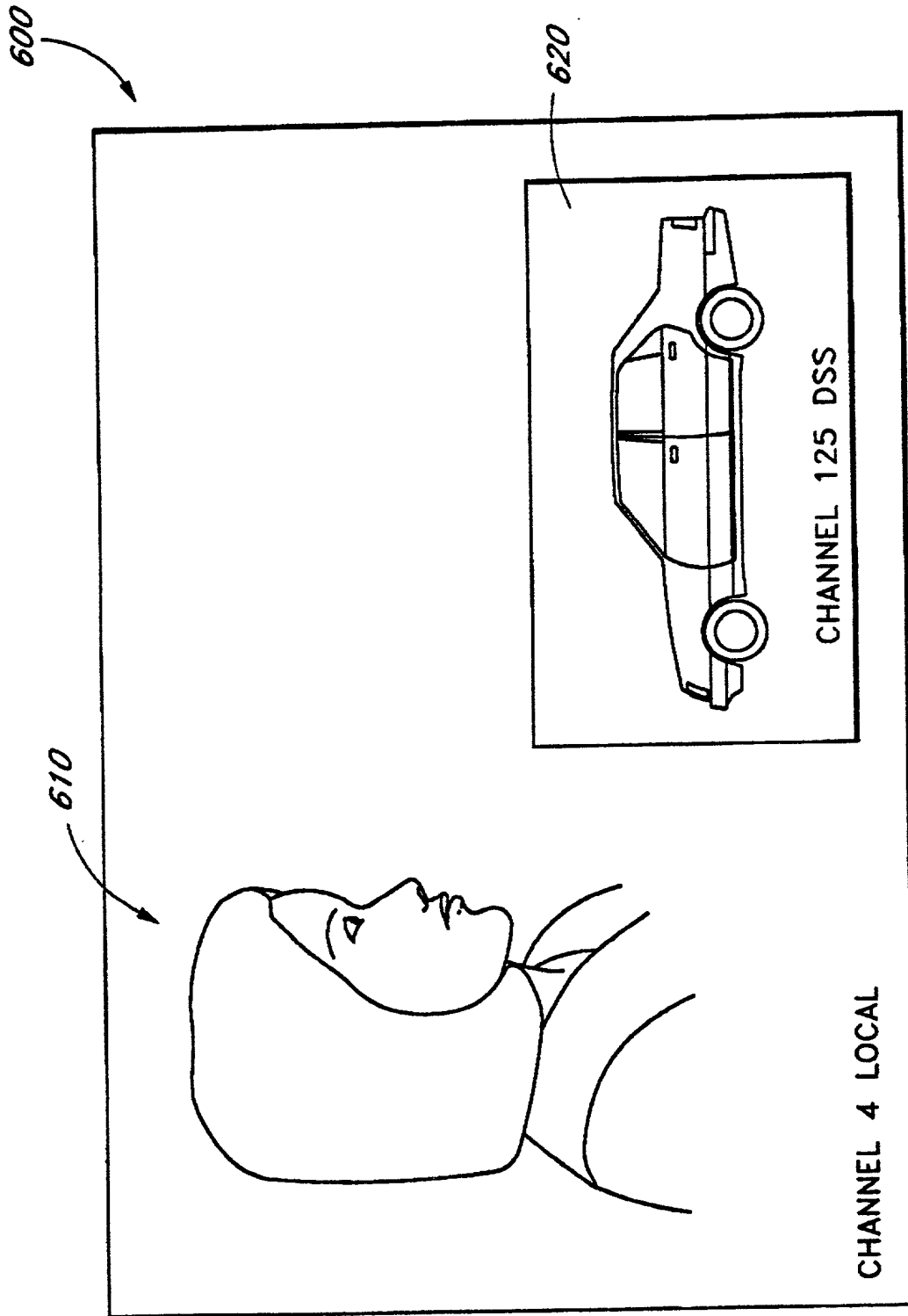620

610

CHANNEL 125 DSS

CHANNEL 4 LOCAL

FIG.6

DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below, next to my name.

I believe I am the original, first, and sole inventor (if only one name is listed below) or any original, first, and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

A SYSTEM AND METHOD FOR PROVIDING DIGITAL VIDEO AND AUDIO BROADCASTS

the specification of which   [X]   is attached hereto.

                [ ]   was filed on _____ as

United States Application Number _____

or PCT International Application Number _____

and was amended on _____ .

(if applicable)

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claim(s), as amended by any amendment referred to above. I do not know and do not believe that the claimed invention was ever known or used in the United States of America before my invention thereof, or patented or described in any printed publication in any country before my invention thereof or more than one year prior to this application, that the same was not in public use or on sale in the United States of America more than one year prior to this application, and that the invention has not been patented or made the subject of an inventor's certificate issued before the date of this application in any country foreign to the United States of America on an application filed by me or my legal representatives or assigns more than twelve months (for a utility patent application) or six months (for a design patent application) prior to this application.

I acknowledge the duty to disclose all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, Section 119(a)-(d), of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s):

APPLICATION NUMBER	COUNTRY (OR INDICATE IF PCT)	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 37 USC 119
			☐ No ☐ Yes
			☐ No ☐ Yes
			☐ No ☐ Yes

I hereby claim the benefit under Title 35, United States Code, Section 119(e) of any United States provisional application(s) listed below:

APPLICATION NUMBER	FILING DATE

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to disclose all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

APPLICATION NUMBER	FILING DATE	STATUS (ISSUED, PENDING, ABANDONED)

I hereby appoint BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP, a firm including: Farzad E. Amini, Reg. No. P42,261; Aloysius T. C. AuYeung, Reg. No. 35,432; William Thomas Babbitt, Reg. No. 39,591; Carol F. Barry, P41,600; Jordan Michael Becker, Reg. No. 39,602; Bradley J. Bereznak, Reg. No. 33,474; Michael A. Bernadicou, Reg. No. 35,934; Roger W. Blakely, Jr., Reg. No. 25,831; Gregory D. Caldwell, Reg. No. 39,926; Kent M. Chen, Reg. No. 39,630; Lawrence M. Cho, Reg. No. 39,942; Yong S. Choi, Reg. No. P43,324; Thomas M. Coester, Reg. No. 39,637; Roland B. Cortes, Reg. No. 39,152; Barbara Bokanov Courtney, Reg. No. P42,442; William Donald Davis, Reg. No. 38,428; Michael Anthony DeSanctis, Reg. No. 39,957; Daniel M. De Vos, Reg. No. 37,813; Tarek N. Fahmi, Reg. No. P41,402; James Y. Go, Reg. No. 40,621; Richard Leon Gregory, Jr., P42,607; Dinu Gruia, Reg. No. P42,996; David R. Halvorson, Reg. No. 33,395; Thomas A. Hassing, Reg. No. 36,159; Phuong-Quan Hoang, P41,839; Willmore F. Holbrow III, Reg No. P41,845; George W Hoover II, Reg. No. 32,992; Eric S. Hyman, Reg. No. 30,139; Dag H. Johansen, Reg. No. 36,172; William W. Kidd, Reg. No. 31,772; Tim L. Kitchen, Reg. No. P41,900; Michael J. Mallie, Reg. No. 36,591; Paul A. Mendonsa P42,879; Darren J. Milliken, P42,004; Thinh V. Nguyen, Reg. No. 42,034; Kimberley G. Nobles, Reg. No. 38,255; Michael A. Proksch P43,021; Babak Redjaian, Reg. No. 42,096; James H. Salter, Reg. No. 35,668; William W. Schaal, Reg. No. 39,018; James C. Scheller, Reg. No. 31,195; Anand Sethuraman, Reg. No. P43,351; Charles E. Shemwell, Reg. No. 40,171; Maria McCormack Sobrino, Reg. No. 31,639; Stanley W. Sokoloff, Reg. No. 25,128; Allan T. Sponseller, Reg. No. 38,318; Steven R. Sponseller, Reg. No. 39,384; Geoffrey T. Staniford, P43,151; Judith A. Szepesi, Reg. No. 39,393; Vincent P. Tassinari, Reg. No. P42,179; Edwin H. Taylor, Reg. No. 25,129; George G. C. Tseng, Reg. No. 41,355; Lester J. Vincent, Reg. No. 31,460; John Patrick Ward, Reg. No. 40,216; Stephen Warhola, P43,237; Ben J. Yorks, Reg. No. 33,609; and Norman Zafman, Reg. No. 26,250; my attorneys; and Amy M. Armstrong, Reg. No. P42,265; Robert Andrew Diehl, Reg. No. P40,992; and Edwin A. Sloane, Reg. No. 34,728; my patent agents, with offices located at 12400 Wilshire Boulevard, 7th Floor, Los Angeles, California 90025, telephone (714) 557-3800, with full power of substitution and revocation, to prosecute this application and to transact all business in the Patent and Trademark Office connected herewith.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full Name of Sole/First Inventor (given name, family name) **David Alan Desch**

Inventor's Signature _____   Date ___OCT 27, 1998___

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